

**Seismic Holography of the Solar
Interior and Far Side**

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The development of solar acoustic holography has opened a major new diagnostic avenue in local helioseismology. Its application to SOI-MDI data from *SOHO* has revealed “acoustic moats” surrounding sunspots, “acoustic glories” surrounding complex active regions, and “acoustic condensations” suggesting the existence of significant seismic anomalies up to 20 Mm beneath active-region photospheres. It has given us the first seismic images of a solar flare, and has uncovered a remarkable anomaly in the statistical distribution of seismic emission from acoustic glories. Phase-sensitive seismic holography is now producing high-resolution maps of sound travel-time anomalies caused by magnetic forces in the immediate subphotosphere, apparent thermal enhancements in acoustic moats, and Doppler signatures of sub-surface flows. It has also produced the first seismic images of active regions on the far-side of the Sun, giving us a powerful tool for forecasting more than a week in advance their arrival at the east limb. This diagnostic now promises a new insight into the hydromechanical and thermal environments of the solar interior in the local perspective.

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